C-A OPERATIONS PROCEDURE MANUAL

C-A TPL 03-06 TEMPORARY PROCEDURE TO LIMIT THE NUMBER OF P^ IN THE AtR TRANSFER LINE

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Reviewed by:_____ _____
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Approved by:_____ _____
Assoc. Chairman for Safety Date

P. Ingrassia

C-A TPL 03-06 TEMPORARY PROCEDURE TO LIMIT THE NUMBER OF P^ IN THE AtR TRANSFER LINE

1. Purpose

1.1 The purpose of this procedure is to instruct MCR Operators and Operations Coordinators (OCs) in the use of the tools provided for the purpose of limiting the number of protons in the AtR line.

1.2 This procedure, and the AGS A20 Current Transformer interlock feature, is to be used whenever protons are fast extracted from the AGS into the W line (the psuarc8 (8 degree) and pswarc20 (20 degree) power supplies are **on**).

1.3 This procedure is **not** used when high intensity protons are fast extracted into the V line or slow extracted (the psuarc8 (8 degree) and pswarc20 (20 degree) power supplies are **off**) or AGS beam stops in LtB are closed.

1.4 This procedure does not apply when the AGS F15 (high intensity proton) Current Transformer is used.

1.5 This procedure is used to inform operations how radiation safety administrative controls are used to keep protons from the high intensity source from BAF. A goal is to remove this beam constraint at some time in the future.

2. Responsibilities

2.1 MCR operations group members are responsible for the execution of this procedure.

3. Prerequisites

3.1 The AGS A20 circulating beam current transformer is operating as well as the current transformer inputs into the Access Controls System and the Beam Permit System.

3.2 The target group for this procedure is the MCR Operators and OCs.

3.3 The training requirement for this procedure is read and sign.

3.4 The minimum number of staff members that need to be trained in order for this procedure to be effective is two, one OC and one operator.

4. Precautions

4.1 None

5. Procedure

Note 1:
The gain settings of the A20 transformer are archived but not watched according to any procedure. The electronics that assure that beam intensity remains within a prescribed window, also guards against allowing too many particles into the AGS under the condition where the A20 gain is lowered. IF the gain is changed during periods when the A20 transformer is used to measure beam current, THEN the system will trip.

5.1 Automation

5.1.1 Many of the steps of this procedure lend themselves to automation using a "sequencer" as is standard practice in RHIC and SEB operations. Before Operations may use an automated version of the steps in paragraph 5.3.1, approval of the contents of the sequence shall be given by the cognizant Physicist, Leif Ahrens, and a Physicist designated by the Chairman of the Radiation Safety Committee.

5.2 Operation

Note 2:

The A20 current transformer always has the potential to inhibit the beam via the Access Control System AND the Beam Permit System (BPS). **The inputs to the Access Controls System are ignored if the psuarc8 and pswarc20 power supplies are off OR if LtB beam stops 1 and 2 are closed OR if LtB beam stop 2 and LtB magnet DH1 power supply is off**. The inputs to the Beam Permit System are ignored when the inputs are masked off. High Intensity Proton Operation requires that the supplies be off and the BPS inputs masked.

A separate subsystem in the ACS shuts off the psuarc8 and pswarc20 when the high intensity proton source is allowed to send beam into the Linac.

5.2.1 The cognizant physicist, along with the instrumentation group, shall set the window of operation for A20 interlock electronics. They are authorized to make changes as required by the changing physics program requirements.

5.2.2 IF psuarc8 and pswarc20 are on, THEN the A20 inputs to the Beam Permit System shall **not** be masked off.

5.3 Verification of "Keep Alive" Operation

Note 3:

A "keep alive current" flows through the current transformer to verify that the transformer is working and connected to the Access Controls System and the Beam Permit system. The verification procedure, below, tests the operation of the keep alive current and the high intensity interlock limit.

5.3.1 During proton operations, IF psuarc8 and pswarc20 are on for beam operations at any time during the day, THEN do the following once a day

5.3.1.1 Verify that AGS A20 Interlock inputs into the Beam Permit System are not masked off.

5.3.1.2 Inhibit Linac pulse

5.3.1.3 Open/Turn on AGS critical devices (eg. beam stops)

5.3.1.4 Go to SpreadSheet/AGS/Safety/Beam_inhibit and turn ON A20.NEG_TESTTR.ST in order to test the operation of the keep alive current source.

5.3.1.5 Observe closure AGS critical devices turn off accompanied by an alarm on the ADT from the A20 Transformer inputs to the Beam Permit System.

5.3.1.6 Turn OFF SpreadSheet/AGS/Safety/Beam_inhibit A20.NEG_TESTTR.ST

5.3.1.7 Enable/trigger the Beam Permit System inputs at pet/AGS/Instrumentation/Beam_Inhibit/Permit

5.3.1.8 Reset the A20 interlock electronics by pushing the button at MCR_2-0

5.3.1.9 Repeat steps 5.3.1.3 through 5.3.1.8 for A20.POS_TESTTR.ST in order to test the operation of the high intensity interlock limit.

5.3.2 The OC shall make note of successful and unsuccessful tests in the OC shift log.

5.4 Recovery from an interlock

5.4.1 IF the AGS critical devices are turned off due to an A20 Current Transformer interlock, THEN

5.3.1 Reduce the intensity of the beam that will be injected into the Booster.

5.3.2 Go to pet/AGS/Instrumentation/Beam_Inhibit/Permit and enable (trigger) the input channels that were disabled by the interlock

5.3.3 Go to MCR_2-0 and push the A20 transformer rest button

5.3.4 Turn on the AGS critical devices

5.3.5 Resume operation.

5.5 Booster Applications Facility

5.5.1 Keeping High Intensity protons from the BAF while running BLIP and Polarized Protons for RHIC

5.5.1.1 The Booster LP requires that RS LOTO be applied to either the Booster D6 septum and BAF beam plug, or the LtB Beamstops, or the vacuum valve downstream of the high intensity proton ion source.

5.5.1.2 Before Monday 10 February, BLIP was run because RSLOTO was applied to the LtB beam stops

5.5.1.3 After Monday 10 February LtB beam stops will be opened. In order to operate BLIP

- Ramp psuarc8 and pswarc20 to zero
- Set psuarc8 and pswarc 20 to STBY (protects critical devices from PASS)
- Open the Vacuum Valve downstream of the source.
- To fill RHIC the vacuum valve must be closed BEFORE turning on the eight and twenty degree bend power supplies

6. Documentation

6.1 OC Shift Log

7. References:

7.1 None

8. Attachments:

8.1 None